REMARKS

Applicant thanks Examiner for the opportunity to discuss the case in a telephone interview on December 19, 2006. Applicant notes that the 35 USC §§ 101, 102, and 103 rejections were discussed as well as certain amendments that might overcome these rejections. Applicant now submits new claims taking into account the Examiner's comments. Although new claims have been submitted, they are based largely on the now cancelled claims 46-51 and thus further discussion based on the rejections contained in the Office Action dated 03/30/06 are still relevant to the prosecution of the new claims.

I. Claim Rejection – 35 USC § 101

Examiner rejects claims 46-51 and asserts that "no actual, concrete result is recited in the claims, nor is any useful result "produced" in a tangible form useful to one skilled in the art. As discussed in the interview, the language "reporting the allele calls to a user" has been added to satisfy the "useful to one skilled in the art in a tangible form" requirement. Such results are typically used in the area of human identification, for example, forensic identification applications. With the addition of the aforementioned limitation, Applicant respectfully requests that the rejection be withdrawn.

II. Claim Rejection – 35 USC § 101 – New Matter

Examiner rejects claims 46-51 asserting that the language relating to a "two-stage allele caller" is new matter. Applicant has removed this language from the claims and respectfully requests that the rejection be withdrawn.

III. Claim Rejection – 35 USC § 112, 2nd paragraph

Examiner rejects claims 46-51 asserting that the language relating to a "two-stage allele caller," "first stage," "second stage," and "operating region" is unclear. Applicant

118020_1

- 5 -

has removed this language from the claims and respectfully requests that the rejection be withdrawn.

IV. Claim Rejection – 35 USC § 102(e)

Examiner rejects claims 46, 47, 51 as anticipated by Perlin (US 6,807,490). In the reply to the Office Action of 08/09/05 Applicant argued that the windowing of Perlin is performed on the DNA sizing data rather than on the sample fragment-length data. What's more the instant application performs its windowing based on the calculation of local minima and maxima which is not an element in Perlin. While Examiner did not find this argument persuasive, Applicant maintains this position. However, the argument is now moot as the currently amended claims contain the limitations of claim 48 which was not included in the rejection. Therefore, Applicant respectfully requests that Examiner withdraw this rejection.

V. Claim Rejection – 35 USC § 103(a)

Examiner rejects claims 48-51 as anticipated by Perlin (US 6,807,490) in view of Bahler et al (US 4,241,329). Examiner claims that it would have been obvious to one of ordinary skill in the art at the time of the instant invention to practice the correction/processing of data in different spectral windows of Bahler et al. with the DNA analysis system of Perlin, where the motivation would have been to reduce the false alarm signal detection rate as taught by Bahler et al.

Applicant respectfully asserts that the Examiner has failed to meet his burden in establishing such a motivation. According MPEP § 2143.01

The teaching, suggestion, or motivation must be found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit

118020_1   - 6 -

showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000).

Based on the above guidance, no explicit motivation to combine exists. Perlin makes absolutely no mention of the terms "false," "alarm," "false alarm," or "false alarm signal." Clearly, the concept of false alarm signal detection was not considered by Perlin. Similarly, an implicit motivation to combine does not exist as Perlin makes no mention of terms that one skilled in the art might equate with false alarm signal detection. The most common term relating to this concept is that of "receiver operator characteristics" which characterizes the number of false positives given a varying system parameter. Perlin makes no mention of "receiver operator characteristics," their associated "ROC curves," or "false positives."

Furthermore, Bahler represents nonanalogous art under MPEP § 2141.01(a). According to this section,

[i]n order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant"s endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also In re Deminski, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992) ("A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem."); Wang Laboratories Inc. v. Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993); and State Contracting & Eng'g Corp. v. Condotte America, Inc., 346 F.3d 1057, 1069, 68 USPQ2d 1481, 1490 (Fed. Cir. 2003) (where the general scope of a reference is outside the pertinent field of endeavor, the reference may be considered analogous art if subject matter disclosed therein is relevant to the particular problem with which the inventor is involved).

Applicant argues that Bahler is art for speech recognition, in particular recognizing one or more keywords in a continuous audio signal whereas Perlin and the

instant application deal with DNA fragment analysis. It is highly unlikely that one skilled in the art of DNA fragment analysis would look to art in the area of speech recognition. Also, the argument that the art is reasonably pertinent must fail given that, as previously discussed, Perlin makes no suggestion that ideas can be borrowed from the field of speech recognition.

Regardless of these points, there are significant differences in the passages pointed to by the examiner such that the elements in Bahler do not read on the limitations of the current claims.

a. **Bahler's peak values of likelihood statistics element fails to read on the instant invention's defining energy panels concept**

Examiner asserts that the concept of peak value of likelihood statistics being determined for each of the selected patterns; sequential selection of candidate keywords based on determination of local maximum likelihood statistics for multi-frame patterns and threshold comparisons correlates to defining energy panels as in instant claim 48. Applicant cannot see this equivalence and respectfully requests that the Examiner either further explain the supposed equivalence of the cited passage or withdraw this argument.

b. **Bahler's "creation of windowed spectra" fails to read on the instant invention's defining energy panels**

It is not clear from the Office Action which limitation that the Examiner's reference to Bahler in bullet point two on page 10 is intended to read on. Applicant assumes that it is intended to read on the instant application's windowing. If this is in error Application request that Examiner informs him. However, moving forward with this assumption, it appears that Examiner asserts that creation of windowed spectra; determination of peak amplitude spectral data for target patterns corresponds to

118020_1   - 8 -

limitations of claim 49.

The Bahler concept of selecting a peak in the frequency domain is the equivalent of selecting a specific frequency and is in no way similar to selecting a peak in the time-domain. Applicant respectfully requests that the Examiner either further explain the supposed equivalence of the cited passage or withdraws this argument.

c.   **Bahler's "defining first, second and third successive spectrum members" language fails to read on the instant invention's defining of energy panels**

Examiner asserts that defining first, second, and third successive spectrum members in a multi-frame pattern corresponds to instant claim 48. In particular, Examiner points to Bahler's column 12 lines 55-67 which state,

> The stored spectra, at 95, representing the incoming continuous audio data, are compared with the stored template of target patterns indicated at 96, representing keywords of the vocabulary according to the following method. Each successive transformed, frequency-response equalized spectrum is treated as a first spectrum member of a multi-frame pattern, here a three spectrum pattern which corresponds to a 96-element vector. The second and third spectrum members of the pattern, in the illustrated embodiment, correspond to spectra occurring 30 and 60 milliseconds later (in real time). In the resulting pattern, indicated at 97, then, the first selected spectrum forms the first 32 elements of the vector, the second selected spectrum forms the second 32 elements of the

This passage shows that Bahler divides his frequency spectrum into equally sized windows to provide three mini-spectra for comparison to a database of spectra. A comparison between these three concurrent spectra and a database entry of three concurrent spectra is used to determine if a given signal corresponds to a particular word represented by the database entry.

The present invention divides the signal into windows based on the location of local minima, not based on generating windows of equal width. This process is significantly different than Bahler's and Applicant respectfully requests that the Examiner either further explain the supposed equivalence of the cited passage or withdraw this argument.

d.   Bahler's "applying a continued likelihood ratio test" language" fails to read on the instant inventions first and second test limitation

Examiner asserts that applying a continued likelihood ratio test to selected patterns corresponding to candidate keywords to determine a figure of merit for each pattern corresponds to a first test and a second test as in instant claim 48. Examiner also asserts that determining if a candidate words figure of merit exceeds a predetermined minimum value correlates to accepting/rejecting data if first and second test are passed corresponds to the two-step process of claim 48.

Applicant represents that the language of the two-step process has been removed and thus this supposed equivalence should be withdrawn as an argument.

Even in the absence of removal of the "two-step" term, a likelihood test is based on the concept that, "different populations generate different data sample, and any given data sample is more likely to have come from some population than from others" (Haykin, Adaptive Filter Theory, page 802, Prentice Hall, 2002). The likelihood test is a test based in the statistics of a population. As such it requires *a priori* information. The instant application does not use *a priori* information, or information outside of the signal itself, or probabilistic calculations. The instant invention compares intra-signal characteristics, namely the values of energy in different segments of the signal, with each other.

Applicant respectfully requests that the Examiner either further explain the

supposed equivalence of the cited passage or withdraw this argument.

     e.   **Bahler's "successively smoothed spectra using the FFT" language fails to read on the instant inventions computation of energy limitation**

Examiner argues that successively smoothing spectra using the FFT is an inherent teaching for obtaining energy via the integral as in instant claim 50. In particular, Examiner points to Bahler's column 9 lines 20-25 which states,

> within the conventional computer hardware, the process may be speeded considerably if an external hardware multiplier or Fast Fourier Transform (FFT) peripheral device is utilized. The construction and operation of such modules are well known in the art, however, and are not described in detail herein.

Applicant does not understand how this passage equates to the computation of the energy of a signal as stated in now pending claim 52. Bahler does not mention computation of energy in this passage and if the Examiner is asserting that the integration function involved in computing an FFT of a time-domain signal is synonymous with computing the energy in a signal in the DNA-fragment length domain, Applicant finds this to be far to broad and abstract an interpretation. In Bahler, the FFT is used to perform standard frequency-domain filtering by multiplication by a windowing function (column 9 line 25-30.) The instant invention does not make mention of a) conversion to the frequency domain via FFT, b) frequency-domain filtering, or an external hardware multiplier. Applicant respectfully requests that the Examiner either further explain the supposed equivalence of the cited passage or withdraw this argument.

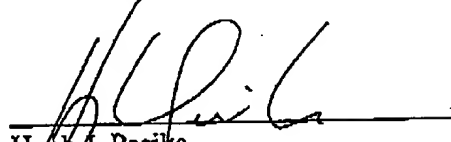## REQUEST FOR TIME EXTENSION and FEE AUTHORIZATION

A Petition for an Extension of Time under 37 CFR 1.136(a) is being filed with this response. Should any additional fees not submitted with this response be required,

please take such fees from Applied Biosystems Deposit Account No. **01-2213 (Order No. 4615).**

Respectfully submitted,

Date: _12/21/06_

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118020_1   - 12 -

PAGE 15/15 * RCVD AT 12/29/2006 1:40:30 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/9 * DNIS:2738300 * CSID:650 638 6677 * DURATION (mm-ss):04-18